



Environmental Remediation Group

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July 26, 2019

Ms. Lynne Jennings  
Section Chief - Massachusetts Superfund Section  
United States Environmental Protection Agency (USEPA)  
EPA Region 1 – New England  
5 Post Office Square, Suite 100  
Mail Code OSRR07-4  
Boston, MA 02109-3912

**RE: Containment Area Soils Investigation  
Olin Chemical Superfund Site (OCSS)  
Wilmington, MA**

Dear Ms. Jennings:

Transmitted herewith is a memorandum that proposes investigative activities associated with soils within the Containment Area at the Olin Chemical Superfund Site in Wilmington, MA. This memorandum is intended to serve as a stand-alone investigation proposal separate from the Data Gaps Work Plan to be submitted on August 2, 2019. Please contact me should you have any questions related to the information contained herein.

Sincerely,

A handwritten signature in black ink, appearing to be "J. Cashwell", followed by a long horizontal line.

James Cashwell, PE, BCEE  
Director, Environmental Remediation

Enclosure

cc Melanie Morash (USEPA RPM)  
Chinny Esakkiperumal (Olin)  
Libby Bowen (Wood)



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## Memorandum

**To:** **Olin Corporation**  
James Cashwell  
Chinny Esakkiaperumal

**From:** **Wood Environment & Infrastructure Services, Inc.**  
Libby Bowen  
Peter Thompson  
Hank Andolsek

**Date:** July 25, 2019

**Subject:** Supplemental Characterization of Soil Within the Containment Area

As discussed during the June 26, 2019 meeting with the United States Department of Environmental Protection (USEPA), Wood Environment & Infrastructure, Inc. (Wood) has prepared this scope of work to describe supplemental soil investigation activities proposed for the Containment Area located at the Olin Chemical Superfund site, 51 Eames Street in Wilmington, Massachusetts.

## Introduction

Supplemental soil characterization activities are being proposed to assess whether soil remaining within the Containment Area possess the characteristics of a Resource Conservation and Recovery Act (RCRA) characteristic hazardous material. As discussed during the June 26, 2019 meeting, Toxicity Characteristic Leaching Procedure (TCLP) data was only collected for soils excavated, segregated, and disposed of off-site during prior removal actions conducted under the Massachusetts Contingency Program (MCP). There is no TCLP data for soils remaining within the Containment Area. If soil is identified, based on location, as previously excavated and returned as backfill and is determined to be hazardous, it would then be considered a RCRA characteristic hazardous waste. USEPA indicated that the additional soil characterization proposed in this memo is needed to appropriately evaluate the capping alternative for the containment area in the Interim Action Feasibility Study.

## Objectives

The objectives of the supplemental soil investigation activities are described below.

- Review historical data relevant to past disposal activities to identify areas where borings would most likely encounter contaminated soil representative of conditions within the containment area, and



- Provide methods and procedures to collect soil samples from these areas within the Containment Area to assess whether soils exhibit characteristics of RCRA hazardous materials.

## Background

In 2000 and 2001, Olin constructed a Slurry Wall/Cap around the on-Property portion of the Upper Dense Aqueous Phase Liquid (DAPL) Pool as a Release Abatement Measure (RAM) in accordance with MCP. This work was documented in the Part 2 Construction-Related Release Abatement Measure Status Report No. 8 (GEI, 2004). This area is referred to as the Containment Area.

The Containment Area is comprised of a perimeter slurry wall installed, to the extent feasible, into the weathered bedrock and a temporary cap to minimize infiltration of precipitation. Several historical disposal areas located within the footprint of the Containment Area were delineated and addressed in 2000 under the MCP prior to the construction of the Slurry Wall. This work was documented in the Part 2 Construction-Related Release Abatement Measure Status Reports No. 1 (GEI, 2000) and No. 2 (GEI 2001). The specific disposal areas within the Containment Area are shown on **Figure 1** and described below.

**Drum Area A** – This area consisted of drums and miscellaneous waste containing N-nitrosodiphenylamine (NDPA), bis 2-ethylhexyl phthalate (BEHP), trimethylpentenes (TMPs), and chromium. Drum Area A was excavated to approximately 8 feet below ground surface (bgs) and 3200 cubic yards (cy) of soil was stockpiled and tested. One hundred-sixty overpacks of old drums and drum fragments, 34 tons of metal debris, and approximately 200 cy of soil were excavated and transported off-site for disposal. Following testing it was determined that remaining stockpiled soil was suitable for reuse. The excavation was backfilled with blast rock from the retention basin, and stockpiled soil from Drum Area A and the adjacent excavation.

**Drum Area B** – This area contained drums, laboratory bottles, and miscellaneous wastes that included NDPA, BEHP, phthalates, and chlorobenzenes. The buried drum areas also contained Opex and Kempore. Drum Area B was excavated to approximately 6 feet and approximately 1150 cy of soil was stockpiled and tested. Three overpacks of drum parts and two tons of metal debris were excavated and disposed off-site. Following testing it was determined that the stockpiled soil was suitable for reuse. Approximately 650 cy of soil was used to backfill Drum Area B. The remainder of the soil (including peat) was structurally stabilized with cement and calcium sulfate and used as backfill within the Containment Area.

**Buried Debris Area** – This area contained metal debris which was disposed off-site as non-hazardous solid waste. Approximately 2315 cy of peat and sediment material were excavated



from the Buried Debris area for structural reasons. This soil was tested and transported off site for disposal. Large boulders were placed in the excavation as back-fill.

**Acid Pits** - Three Acid Pits received acidic, chromium-containing, manufacturing waste water. Sodium dichromate was used in the production of Kempore until 1967 and, like the former Lake Poly, the Acid Pits received acidic waste containing chromium sulfate. The three unlined Acid Pits were closed in 1971.

**Lined Lagoons I and II** – Two lined lagoons replaced the Acid Pits and were used for the disposal of manufacturing waste waters. The lagoons received acid wastes that did not contain sodium dichromate and were neutralized with lime. This resulted in a calcium sulfate slurry that was dewatered and placed in the Calcium Sulfate Landfill. Lagoons I and II were constructed with poly vinyl chloride liners in 1972 in the vicinity of the three Acid Pits. After purchasing the property in 1980, Olin relined the lagoons with hypalon liners in 1981 (Lagoon I) and 1983 (Lagoon II).

There is no record of the disposition of soil in and around the Acid Pits at the time of the construction of the lined lagoons, nor is the disposition of the soil from the Acid Pits documented. The Acid Pits previously received chromium-containing waste water. Elevated concentrations of chromium were detected in soil south of Lagoon 1 (**Figure 1**).

### **Evaluation Criteria for RCRA Hazardous Waste**

RCRA has specific criteria for determining if a solid waste is a hazardous waste. A solid waste is classified as hazardous if it is a characteristic waste (exhibiting toxicity/leachability, corrosivity, ignitability, or reactivity) or if it is a listed hazardous waste. If a solid waste is classified as a hazardous, RCRA Subtitle C capping requirements are typically applicable, otherwise, RCRA Subtitle D capping requirements are applicable.

### **Analytical Approach and Soil Boring Locations**

Soil sampling will target previously excavated areas to confirm back fill conditions and areas with elevated chromium which may represent remnants of former disposal features. Previous soil sampling conducted within the Containment Area included collection of samples from depths ranging between 3 and 8 feet bgs. This is consistent with the depths of remedial excavations discussed above.

A total of eight soil boring locations will be advanced within the Containment Area using direct push technology. The location of each proposed boring is shown on **Figure 1**. Soil cores will be collected continuously from ground surface to the water table or a depth of 10 feet, whichever is shallower. So that a complete soil profile is evaluated, samples will be collected at two foot intervals. This sample



length will also provide adequate volume for required analytical program. Additional information regarding the criteria used to select each boring location is provided below.

Per discussions with USEPA, the samples will be analyzed for the OU1 RI Comprehensive Analytical List and site-Specific Compounds in addition to RCRA parameters. The RCRA parameters and associated analytical methods identified in **Table 1** below.

The Comprehensive Analytical List includes VOCs, SVOCs, N-nitrosodimethylamine, metals, ammonia, sulfate, chloride. The analytical suite will include specialty compounds including dimethylformamide, phthalic anhydride, hydrazine, and diphenylamine. Pesticides, herbicides and polychlorinated biphenyls are not COCs at the site and are not recommended analytes. OPEX and Kempore were not soil analytes for OU1 and these two constituents cannot be analyzed due to lack of reliable standards. Since extractable petroleum hydrocarbons and volatile petroleum hydrocarbons (VPH) were specific to Plant B, EPH/VPH is not proposed for analysis.

**Table 1**

**Laboratory Analytical Methods Proposed for RCRA Characterization of Soil**

Analysis	TCLP Metals			Corrosivity	Ignitability	Reactivity		VOCs	SVOCs
USEPA Method	1311	6010	7471	1110	1030	9010	9030	8260	8270

Because chromium is less mobile in the environment than most volatile or semi-volatile compounds, chromium at elevated concentrations makes a good location indicator of other potential residual waste material within the Containment Area. The distribution of chromium-impacted soil (1-10 feet in depth) presented in the Remedial Investigation Report for OU1 and OU2, was evaluated and areas of chromium concentrations of 500 milligrams per kilogram (mg/kg) or greater were identified and contoured (**Figure 1**). There is not a specific regulatory basis for selecting 500 mg/kg as a contour interval, however the exercise highlights several distinct areas where elevated chromium is located in soil that can be targeted. Three locations within the 500 mg/kg chromium contours will be targeted for sampling (**Figure 1**).

One boring will be located within each of the three former Acids Pits. (Two of these borings will also serve to evaluate the fill and substrate of the Lined Lagoons.) Two additional borings will be placed in the largest lagoon, Lined Lagoon II, one in the center, and one in the southern end to evaluate the fill and substrate material.



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Wilmington, Massachusetts

The last (eighth) boring will be located in Drum Area A to verify that the backfilled material is suitable for reuse as previously indicated. Once sampling is complete, the access holes cut into the temporary cover will be patched using reinforced tape.

Sample collection, handling, preservation, documentation and equipment decontamination will follow procedures described in the revised QAPP. All excess soils and any drilling fluid will be containerized as Investigation Derived Waste (IDW). IDW will be stored on-site until receipt of analytical results and arrangements can be made for off-site disposal at an appropriately licensed facility.

### **Data Evaluation and Reporting**

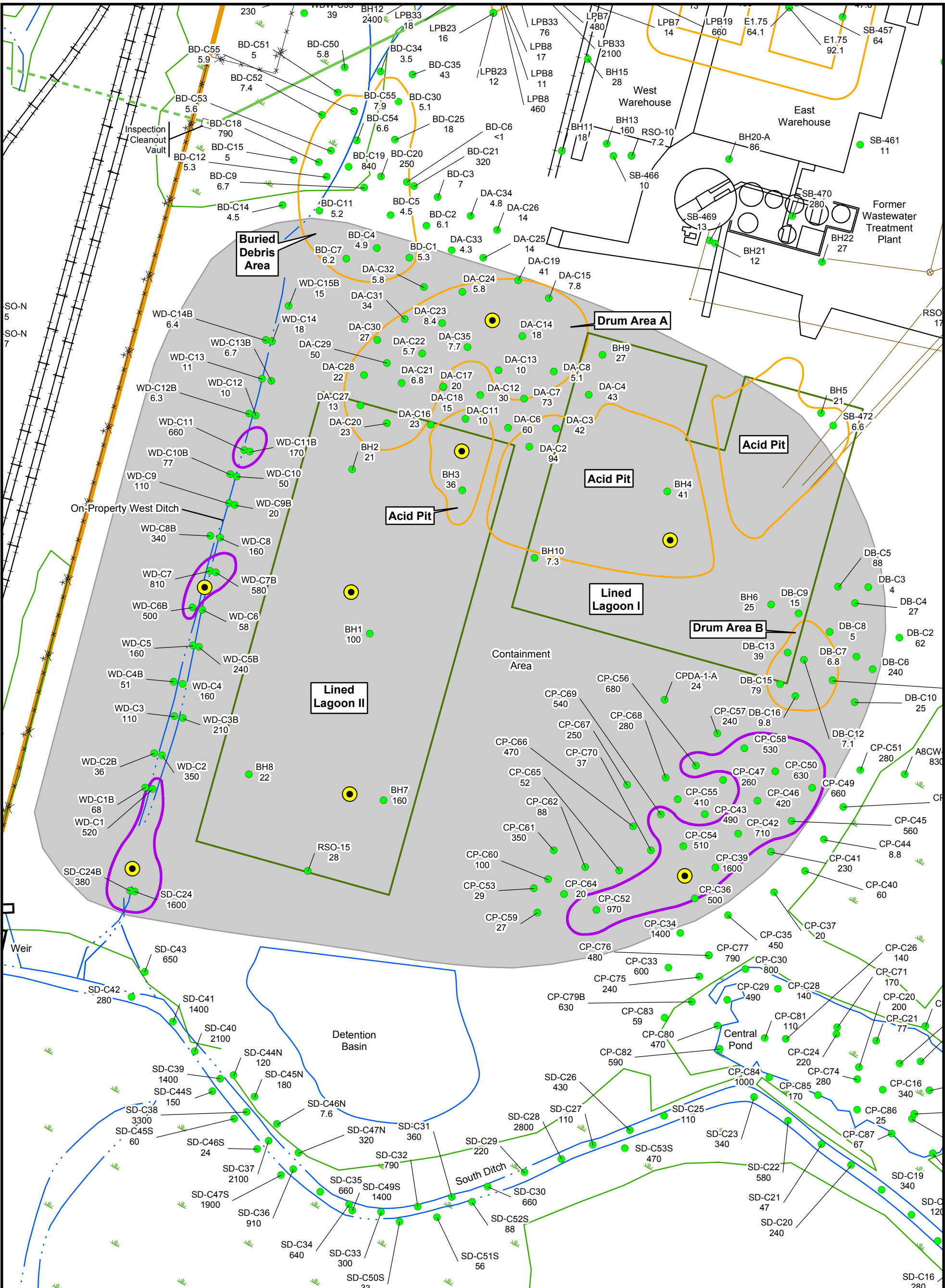
Olin will transmit the raw analytical data to USEPA when it is received from the laboratory. Olin will submit a technical memorandum summarizing the results of this investigation within 30 days of completing data validation. The report will include an evaluation of whether soils within the containment area should be classified as RCRA material.

### **References**

- GEI, 2000. Part 2 Construction-Related Release Abatement Measure Status Reports No. 1 Olin Wilmington Property, 51 Eames Street Wilmington MA, RTN 3-0471
- GEI, 2001 Part 2 Construction-Related Release Abatement Measure Status Reports No. 2. Olin Wilmington Property, 51 Eames Street Wilmington MA, RTN 3-0471
- GEI, 2004 Part 2 Construction-Related Release Abatement Measure Status Reports No. 8. Olin Wilmington Property, 51 Eames Street Wilmington MA, RTN 3-0471







Proposed Boring

Chromium > 500 mg/kg

Historical Chromium Sample Location

51 Eames St. Property Boundary

Containment Structure

Historical Disposal Area

Aboveground Conveyance Piping

Underground Conveyance Piping

Structure

Paved Road

Unpaved Road

Railroad

Town Line

Fence

Trail

Drain/Sewer Line

Surface Water

Wetland Boundary

Wood  
Environment & Infrastructure Solutions  
271 Mill Road  
Chelmsford, MA 01824

0

30

60

120

Feet

**Figure 1**  
**Proposed Boring Locations**

**Olin Chemical Superfund Site**  
**Wilmington, Massachusetts**

Prepared/Date: BRP 07/23/19

Checked/Date: PHT 07/23/19

Document: P:\Projects\oia\wim\Olin Wilmington CERCLA\GIS\MapDocuments\OU3 Supp Investigations\OU3 Containment Areas\_11x17P.mxd PDF: P:\Projects\oia\wim\Olin Wilmington CERCLA\GIS\Figures\OU3 Supp Investigation\Figure 1 - Proposed Boring Locations.pdf 07/23/2019 10:25 AM brian.peters